# ANALYTICAL MICROPROBES: GETTING MORE OUT OF LESS

*José M. Vadillo*

Universidad de Málaga, UMALASERLAB, Jimenez Fraud 3, 29010 Málaga, España-Spain

The arsenal of techniques capable of getting chemical information from reduced spatial domains has been a constant in the analytical instrumentation. Such evolution has run in parallel with the extraordinary advances in the field of microscopy that have produced a deep impact in our vision of the world and the relationship between functionality and molecular structure. It was obvious since our access to the microscopic world that even the most homogeneous structures where far from being considered as such when the zoom was on. Microbeam analysts are challenged daily by the sophisticated problems which arise with our high-tech world, and the shocking voracity of bioanalysis for any tool capable of a better understanding of our living systems.

Since the early days of modern spectrochemical analysis where the capabilities of arc/spark to perform chemical analysis localized over an area of several square millimeters, a long journey has been run. One of the main advances has been the happy marriage of such techniques with mass spectrometry to get the best of both worlds. Nowadays, lasers, electron guns, ion guns, discharge lamps, electrospray jets, metal capillaries and many other approaches are used to create ions from reduced sample areas that are further sorted and detected in a mass spectrometer. The applications are still growing and it is still difficult to see if there is a limit.

The talk will provide an overview of analytical microprobes focusing in those involving lasers and gas guns. Thus, laser-ionization mass spectrometry, secondary ion mass spectrometry or low-energy ion scattering will be commented and compared with some other. Selected applications will be shown trying to emphasize the strengths of the techniques, without forgetting the inherent weaknesses of each one.